The Canadian Entomologist

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OBITUARY

Albert E. Winn

We regret to record the death of Albert E. Winn, Entomologist and Curator of the Lyman Entomological Collection and Library, Redpath Museum, McGill University, Montreal, on July 3, 1935, after a very long illness. During recent years, he had been allowed leave of absence by the Lyman Bequest Committee owing to the serious state of his health, but it was hoped that his health would be restored to him and that he would be able to resume his duties.

When the collection and library of the late Henry H. Lyman was left to the Redpath Museum, where a special room was provided for their deposition, it was fortunate that the late Mr. Winn was chosen as the curator of the same, in view of his close association entomologically with the late Mr. Lyman.

The late Mr. Winn became interested in entomology during his early life, devoting the major portion of his time to studies of certain groups of lepidoptera, as a result of which he contributed much new information.

He was a prominent member of the Montreal Branch of the Entomological Society of Ontario, having been attached thereto for a period of over 47 years. It is largely owing to his efforts that the Montreal Branch was maintained and continued to do useful work.

He served the Montreal Branch as President on numerous occasions and held that position at the time of his death.

During the years 1915-1916 and 1916-1917, he was honoured by being elected President of the Entomological Society of Ontario. He was also a Fellow of the Royal Entomological Society of London.

He was appointed Curator of the Lyman Collection and Library in 1914 and during the 20 years which he served in this connection, he was responsible for the remarkable growth of the collection from 6 cabinets of 40 drawers each, to 26 cabinets of 730 drawers in all.

In addition to the articles which he contributed to the Canadian Entomologist and other entomological journals, the Quebec Government published two important papers, one, "A List of the Lepidoptera of the Province of Quebec," and another, "A List of the Diptera of the Province of Quebec," which he prepared jointly with Mr. Germain Beaulieu.

The late Mr. Winn was ever ready to help young entomologists or other nature students who desired to have their specimens determined, or who wished information regarding any species which attracted their attention. He assisted very materially in the development of entomology in the Montreal district, and not only will he be missed by the members of the Montreal Branch of the Entomological Society of Ontario, who looked upon him as their leader, but also by many younger naturalists who looked to him for advice and help.—GEO. A. MOORE.

NEW CANADIAN PERLIDS (PART II)

BY WILLIAM E. RICKER,
Pacific Biological Station, Nanaimo, B. C.

Alloperla concolor n. sp.

(Figures 8, 9, 12.)

Length to tip of wings: ♂ 12 mm. ♀ 14 mm.; expanse ♂ 21 mm., ♀ 25 mm.

Head (exclusive of eyes) somewhat wider than prothorax, yellow with obscure light brown markings; lateral tubercles small, pale; ocelli ringed with black, the black sometimes extending a short distance forward and/or toward the eyes. Antennae yellow at base, brown toward the tips, palpi brownish.

Thorax yellow, prothorax with very faint brown markings on the rugosities. Wings clear hyaline, veins tinted with yellow. Legs yellow, tips of tarsi dark.

Abdomen and tails yellow; no dorsal stripe.

Male: No tubercles on 8th or 9th tergite, 9th sternite not produced. Tenth segment cleft dorsally, the sides and anterior border of the cleft chitinized; supra-anal process 1.5 times as long as the 10th segment; process consists of an arched chitinized rod (concave face upward), the projecting part of which is surrounded by a membranous "sleeve"; at its posterior tip is a short thin recurved process, in dorsal view nearly twice as long as broad, its sides straight or barely constricted, and its anterior margin finely and shallowly serrate.

Female: Subgenital plate triangular, extending over about 1/2 of the 9th segment, with a narrow nipple-like tip.

Holotype ♂: Headwaters of Pine River ("E" creek), Horning's Mills, Dufferin Co., Ont., 14.vi.28 (F. P. Ide); in the Royal Ontario Museum of Zoology.

Allotype ♀: The same, 16.vi.28 (F. P. I.)

Paratype: Same data as allotype, 1 ♀. There is also a specimen taken 24.vi.28, lacking abdomen. Paratype deposited in the Canadian National Collection at Ottawa.

This species is very close to the western *A. serrata* Needham and Claassen[1], though considerably larger. The male of *serrata* differs from *concolor* in having the supra-anal process shorter (figured as about 1.2 times the length of the 10th segment), and its tip broader than long. The female *serrata* has no nipple tip to the subgenital plate.

Alloperla onkos n. sp.

(Figures 10, 11, 13)

Length to wing tips: ♂ 10 mm., ♀ 11 mm.; expanse ♂ 18 mm., ♀ 21 mm.

Head (exclusive of eyes) slightly narrower than the prothorax, yellow; ocelli surrounded by black rings of irregular outline; antennae yellow at base, dusky near the tips; palpi brownish yellow, their tips dark.

Prothorax yellow with a brown median region, usually too diffuse to be called a stripe, often extending along the anterior marginal groove, and more broadly spreading rearward; rugosities rather pronounced. Meso- and metathorax each with a narrow black forward-pointing crescent dorsally, and a narrow dark-

[1]Needham, J. G., and P. W. Claassen, 1925. A monograph of the Plecoptera or stoneflies of America north of Mexico. Thomas Say Foundation of Ent. Soc. Am., Vol. 2.

brown stripe on either side running forward from the coxa half-way along the segment. Legs mostly yellow, tips of femora with a narrow black border outside, tips of feet dark. Wings yellowish-hyaline, veins yellow.

Abdomen yellow, with conspicuous black stripe dorsally, its pigment so intense that in dried specimens it often shows through the abdomen, giving the appearance of a more obscure ventral stripe. First 3 or 4 segments have lateral stripes as well, and segment 1 a narrow black anterior border. Segments 8 and 9 have several groups of short spines on their posterior border laterally. Tails yellow.

Male: Ninth sternite produced, its margin appearing rounded or slightly angular. A raised and slightly concave process on the 9th sternite. Tenth tergite cleft, its posterior end forming a cowl over the supra-anal process. The process consists of a deep basal (posterior) part, whose upper margin is curiously lobed in dorsal view (see figure); and a terminal (anterior) part, resembling a thin upward-curving knife with rather blunt tip.

Female: Sub-genital plate occupies about 1/3 of the width of the 8th segment ventrally, and is produced over 2/3 of the 9th. Its sides are slightly tapered, its tip broad with three smooth terminal lobes shallowly marked off from each other, and the median one smaller than the lateral.

Holotype ♂: Headwaters of Pine river ("E" creek), Horning's Mills, Dufferin Co., Ontario, 14.vi.28 (F. P. Ide); in the Royal Ontario Museum of Zoology.

Allotype ♀: Taken in copulation with the holotype.

Paratypes: "B", "E" and "F" creeks, all near Horning's Mills, 5.vi.-3.vii.28, 10 ♂ ♂, 11 ♀ ♀ (F. P. I. and W. E. R.); Mad river at Singhampton, Grey Co., Ont., 29.v.30, 1 ♂; 4.vi.31, 1 ♂ (F. P. I.). Paratype deposited in the Canadian National Collection.

The species seems most like *A. mediana* Banks, of described American species. It may be distinguished by the well-developed tubercle on the 9th abdominal segment of the male, and by the twice emarginate tip of the subgenital plate of the female.

Allocapnia torontonensis n. sp.

(Figures 14, 15, 16)

Length to tip of wings: ♂ 4.5-5 mm., ♀ 7-8 mm.

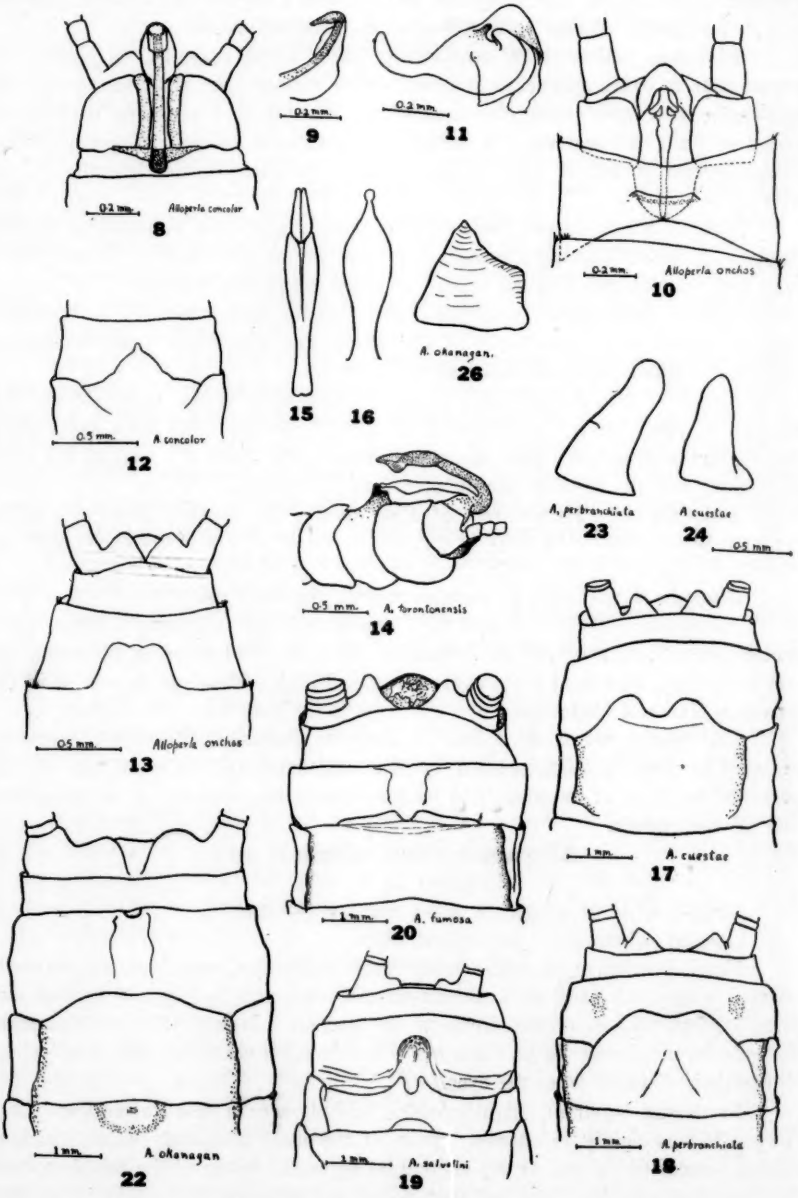
General colour dark brown and black.

Head (exclusive of eyes) wider than prothorax; dark brown, narrowly bordered with black, with dark muscle-attachment marks before and behind each paired ocellus, also in broken lines on the occiput. Mouth parts and antennae dark, the latter having 29-32 segments. Distance between the hind ocelli about 3 times their distance from the eyes.

Prothorax squarish, slightly wider behind, with a few rugosities; Legs brown. Wings lightly infuscated; those of the male uniformly short, reaching the hind border of the 6th or 7th abdominal segment; wings of the female extend slightly beyond the tip of the abdomen, to the 3rd segment of the tails. Venation much as in *A. pygmaea*.

Male: Abdomen dark, with a trace of a light stripe dorsally; anterior borders of tergites 3-8 broadly excavated, the degree of excavation increasing

CAN. ENT. VOL. LXVII PLATE 14



CANADIAN PERLIDS

rearward; hind margin of tergite 8 narrowly excavated and heavily chitinized; the two-pointed tubercle above lies somewhat before the hind margin. Supra-anal process double: the dorsal part is dark, having a chitinous projection ventrally near the tip extending to a membranous sac below—the tip however being less bulbous than is that of *A. pygmaea*; the ventral part of the supra-anal process is nearly transparent, it widens for 2/3 of its length, then is constricted, sometimes rather sharply, to a narrow peduncle having a small spherical tip; in side view it lacks any notch in the dorsal contour. Below the abdomen is lighter, with a dot on either side of the mid-line of segments 1-8, at the middle of the sternite. Ninth sternite slightly constricted at the base rounded or bluntly pointed behind—resembling a broad-stemmed ace of spades. Tips of the subanal lobes elongate, pointed, heavily chitinized, marked off by an angle in the outer margin of the lobe.

Female: Abdomen with a broad light stripe dorsally on segments 1-8; sternites of segments 1-6 with a short dark line, sometimes interrupted, on either side of the mid-line. Eighth sternite somewhat prolonged into a subgenital plate, having a black chitinized dorsally-recurved tip; tip of the 9th sternite also chitinized, but less heavily so.

Holotype ♂: Credit river at Cooksville, Peel Co., Ontario, 2.iii.29 (F. P. Ide); in the Royal Ontario Museum of Zoology.

Allotype ♀: Same data.

Paratypes: Same data, 9 ♂ ♂, 9 ♀ ♀ (alcoholic), 4 ♂ ♂, 4 ♀ ♀ (pinned); Rouge river, York Co., Ont., 23.iii.29, 8 ♂ ♂, 6 ♀ ♀ (F. P. Ide); Mad river at Glen Huron, Simcoe Co., Ont., 21.iii.31, 1 ♂, 3 ♀ ♀ (F. P. Ide). Paratypes have been deposited in the Canadian National Collection, Ottawa, and in the collection of the Illinois State Natural History Survey, Urbana.

This species has been collected for many years past in streams about Toronto by Dr. E. M. Walker. It appears to be the commonest of the early spring stoneflies in this vicinity. In Needham and Claassen's (1925) key it goes to *A. pygmaea* Burmeister, but is readily distinguished by the sexual characters of both male and female. Dr. T. H. Frison of the Illinois State Natural History Survey kindly compared paratypes with the described American species, and with his (at that time) undescribed *A. illinoensis*.

Megaleuctra neavei n. sp.

Length to tip of wings 13 mm.

A detailed description is not possible, because of the state of preservation of the specimen. In general it resembles *M. spectabilis* Neave[2], and like that species has the 8th and 9th sternites produced to form a long ovipositor—a structure unique among stoneflies. It is however considerably smaller. The subcosta of the front wing does not approach the costa so closely near its end as in *spectabilis*; the M-Cu and Cu crossveins are less numerous; the area of the wing beyond the cord is relatively greater. The 2nd tarsal segment is short, but relatively somewhat longer than that of *M. spectabilis*, and the produced portion of the 8th sternite (and probably the 9th too) is, relatively, considerably shorter than in that species.

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[2]Neave, Ferris. 1934. Stoneflies from the Purcell Range, B.C. Can. Ent. 66: 1-6.

Holotype ♀ : Palmnicken, Prussia, in amber of middle Tertiary age; in the Royal Ontario Museum of Palaeontology, No. 7061.

Dr. E. M. Walker first brought to our attention this interesting specimen, and it was assigned to *Leuctra* on the basis of the short 2nd tarsal segment, although considerably larger than most species of that genus. When the recent description of *Megaleuctra* came to our attention, it was not hard to guess that the amber specimen was related to it. Professor Neave has compared the specimen with his species, and the above description is taken from his notes. He adds that "the Prussian specimen . . . tends to emphasize the relationship between *Megaleuctra, Leuctra* and *Taeniopteryx* (sensu lato)."

Acroneuria cuestae n. sp.

(Figures 17, 24)

Length to wing tips: ♂ 23 mm., ♀ 28-30 mm.; expanse, ♂ 39-40 mm,. ♀ 55-58 mm.

General colour yellowish brown.

Head (excluding the eyes) as wide as or slightly wider than the prothorax; a brown spot more or less completely fills the ocellar triangle and extends into the region between the M.-ridge and the lateral tubercles; clypeus brown; frontal M-ridge brownish yellow; posterior portion of the head yellow, except (at times) the brown posterolateral angles; palpi brown; antennae brown except for a dash of yellow along the inside near the base; ocellar triangle equilateral, the ocelli ringed with black though sometimes rather indefinitely so; hind ocelli closer to each other than to the eyes.

Width of prothorax 1.4 times its length; front margin slightly rounded, hind one more so; front angles subacute, hind ones obtuse; surface rugose, brown with or without yellow markings. Legs brown with inner margins yellowish. Wings subhyaline with brown veins; crossveins beyond the cord 0-3 in the front wing, there being almost always one between R_1 and R_2 near the tip; in the hind wing they are usually of about the same number, but the left wing of the allotype has 9.

Abdomen yellow, becoming brown toward the tip, especially in the female. Tails brown.

Male: Hammer of medium size, elongate ellipsoid; genital hooks flattened, rather narrowly triangular, with an acute tip bent sharply forward; dorsal surface of segment 10 with spines not nearly as numerous as in *A. lycorias*, of segment 9 with very few (about 15 on each side of the mid-line).

Female: Subgenital plate produced along the whole posterior margin of the 8th sternite; bearing a rather broad rounded notch medially, the slopes of whose sides at the point of inflexion meet at an angle of 90° or rather more; distance between the apices of the lobes on either side of the notch is 1/3 of the width of the sternite.

Holotype ♂ : Mad river just east of Singhampton, Grey Co., Ontario, at the point where the Niagara escarpment or cuesta breaks away to the plain below, 8.vi.30 (W.E.R.); in the Royal Ontario Museum of Zoology.

Allotype ♀ : Taken in copulation with the holotype.

Paratypes: Same locality, 8-10.vi.30-1 ♂, 6 ♀ ♀; 13.vi.31-1 ♂; 6.vii.31-2 ♀ ♀ (F. P. Ide). Mad river at Glen Huron, Simcoe Co., Ont., 4.vi.32-2 ♂ ♂, 1 ♀; 25.vi.33-1 ♀ (F.P.I.). Paratypes deposited in the Canadian National Collection and in the collection of the Illinois State Laboratory of National History, Urbana.

The species is very close to *A. lycorias* Newman, the male being distinguished by the less heavily armed terminal abdominal segments, the female by the greater length and deeper excavation of the subgenital plate. It also resembles *A. perbranchiata* Neave[3], but may be distinguished by the shape of the male genital hooks, and the female subgenital plate. As the anal gill tufts of *perbranchiata* are difficult or impossible to recognize in dried adults, its genital characters are figured herewith, drawn from paratypes kindly loaned by Professor Neave. (Figures 18, 23.)

Acroneuria salvelini n. sp.

(Figure 19)

Length to tip of wings 25-28 mm., expanse 42-48 mm.

General colour yellow with dark markings.

Head wider than phothorax, even excluding the eyes; clypeus brown, frontal M-ridge yellow; ocellar triangle invariably filled by a black spot which extends sideways nearly surrounding the rather large elongate yellow lateral tubercles, its posterior margin following the line of the frontal suture in a broad arc, rather sharply distinguished from the yellow and (toward the middle) brownish posterior portion of the head.

Prothoracic width 1.6 times its length; front margin slightly rounded, hind one straight; front angles subacute, hind ones obtuse; rugosities yellowish brown, showing clearly against a black background; black band margins the whole prothorax and traverses it in a rather broad stripe medially, such stripe being itself marked by a narrow yellow one along the mid-line. Wings subhyaline, suffused with yellow from costa to radius; veins brown; usually no cross-veins beyond the cord in either wing, but when one is present, it is commonly between R and Rs, situated close to the cord. Meso- and metathorax brown above, yellow below. Legs brownish with yellow near the base, a thin black line at the tip of the femora.

Abdomen yellow, sometimes appearing blackish toward the tip; tails brown.

Male: Unknown.

Female: Subgenital plate evident only near the middle of the sternite, consisting of two narrow lobes with rounded tips; the included notch is of such shape that the slopes of its sides at the points of inflexion are parallel, or meet at a small angle never greater than 45°; the distance between the apices of the lobes on either side of the notch is equal to 1/8 of the width of the sternite.

Holotype ♀: Noisy river, north of Horning's Mills, Dufferin Co., Ontario; 2.vii.28 (F. P. Ide); in Royal Ontario Museum of Zoology.

Paratypes: Same data as holotype, 7 ♀ ♀; Hornings Mills, 5.vii.28, 1 ♀ (W.E.R.); Credit river at Erindale, Peel Co., Ont., 5.vi.34, 2 ♀ ♀, 9.vii.34, 1 ♀ (F. P. I.). Paratypes deposited in the Canadian National Collection and in the

[3]Neave, Ferris. 1933. Some new stoneflies from western Canada. Can. Ent. 65: 235-238.

collection of the Illinois State Laboratory of Natural History.

There are also 3 ♀ ♀ without data in the R.O.M.Z. collection.

This is another species running to *A. lycorias* Newman in Needham and Claassen's (1925) key, but easily distinguishable by the black prothoracic markings, and the shape of the subgenital plate. The latter separates it from *A. perbranchiata* Neave. The type locality is also the home of numerous speckled trout (*Salvelinus fontinalis*).

Acroneuria fumosa n. sp.

(Figure 20)

Length to tip of wings 34-36 mm., expanse 61-64 mm.

General colour brown and yellow above, yellow below.

Head (exclusive of the eyes) rather narrower than the prothorax; ground colour yellow; a black spot covers the ocellar triangle, extending sideways along the hind border of the lateral tubercles to the level of their outer margin, backward to a blunt point in the mid-line posterior to the paired ocelli by about half the distance between them, and forward to the frontal ridge; clypeus brown; frontal M-ridge brown at middle, becoming more yellow as it proceeds anteriorly to where it joins a broad yellow band extending to and including the flat ovoid lateral tubercles; antennae brown; ocellar triangle scarcely equilateral, the hind ocelli slightly closer to the eyes than to each other.

Width of prothorax 1.5 times its length, narrowed behind; front and hind margins scarcely rounded; front angles subacute, hind ones obtuse; surface coarsely rugose, brown and nearly concolorous, but somewhat darker along the mid-line, and the lateral and posterior margins. Legs nearly uniform brown; wings with veins smoky brown and the vane lightly infuscated with the same; no cross-veins beyond the cord in either wing.

Abdomen yellow anteriorly, brown toward the tip; cerci mostly brownish above, but yellow near the base and below.

Male: Unknown.

Female: Subgenital plate occupying only the middle half of the hind border of the eighth sternite, projecting over 1/4 of the ninth; its margin with a smooth notch in the middle, the slopes of whose sides at the point of inflexion meet at about 90°; distance between the apices of the lobes on either side of the notch equal to 1/7 of the width of the sternite.

Holotype ♀: South Bolton, Quebec, 3.vii.32 (F. P. Ide), in Royal Ontario Museum of Zoology.

Paratype ♀: Knowlton, Quebec, 17.viii.30 (L. J. Milne).

Paratype deposited in the Canadian National Collection.

Large size, smoky wings, and the contour of the sub-genital plate will distinguish this species from others of the group having the dark ocellar spot and few crossveins beyond the cord.

Acroneuria okanagan n. sp.

(Figures 22, 26)

Length to tip of wings: ♂, 21-22 mm., ♀ 32 mm.; expanse, ♂ 34 mm., ♀ 53 mm.

General colour yellow and light brown above, yellow below.

Head (exclusive of the eyes) slightly wider than the prothorax in the male, about the same width in the female; distinguished by a relatively long broad clypeus. Colour yellow with brown only on the border of the clypeus and in a spot at the base of the antennae, in the female; males also have the whole posterior portion of the head brown, forward nearly to the median ocellus. Frontal M-ridge well developed; lateral tubercles transversely elongate; ocelli narrowly ringed with black on the inside, forming a depressed-isosceles triangle, the hind pair closer to each other than to the eyes. Antennae brown, yellowish at the base; palpi brown.

Prothorax strongly narrowed behind; margins rounded, especially the hind one; colour of the female yellow with brown margin and rugosites of the holotype all brown except the yellow mid-line and posterior marginal groove. Legs chiefly yellowish; tibiae brown on the outer margin, especially near the proximal end; feet dark brown or black. Wings subhyaline, with a yellowish tint toward the tips and along the costal margins. Crossveins beyond the cord about 8 in the forewing and 11 in the hind wing, variously placed. Median crossveins in the forewing few: 0-1 in the cotypes, 3 in the paratype.

Abdomen brown above, with the segments margined with yellow; brown on the sides; below yellow with the anterior borders of the segments bearing brown bands interrupted in the mid-line (in the male at least).

Male: Hammer on 9th sternite rather small. Genital hooks very broadly triangular with the outer margin flaring to a blunt point, the tip with a short point bent sharply forward. No spines on segments 9 and 10.

Female: Subgenital plate only slightly produced over segment 9, broadly and shallowly excavate at the tip. Posterior margin of segment 7 with a median heavily chitinized and pigmented area, a smaller similar one on segment 4, and a trace of another on segment 5.

Holotype ♂: Summerland, B. C., 2.vii.28 (E. B. S. Logier), in Royal Ontario Museum of Zoology.

Allotype ♀: Same data.

Paratypes: 1 ♂, Summerland, B. C., 13.vii.28, (E. B. S. L.). Paratype deposited in the Canadian National Collection.

The differences in colour noted among these three specimens may be partly ascribed to the fact that the allotype has been tunnelled through by *Dermestes*. The small number of median crossveins in the forewing appears to distinguish it from all other described American species of *Acroneuria*. It is named for the British Columbia lake near which these specimens were taken.

EXPLANATION OF PLATE.

Figure 8. Dorsal view of the terminal abdominal segments of ♂ *Alloperla concolor*, from the holotype (glycerine mount).

Figure 9. Side view of tip of the supra-anal process of *A. concolor*.

Figure 10. Dorsal view of terminal abdominal segments of ♂ *Alloperla onkos*, from a paratype (glycerine mount).

Figure 11. Side view of supra-anal process of *A. onkos*.

Figure 12. Sub-genital plate of ♀ *A. concolor*, from the allotype (pinned).

Figure 13. The same, *A. onkos*, from a paratype (glycerine mount).

Figure 14. Side view of the terminal abdominal segments of ♂ *Allocapnia torontonensis*; supra-anal process raised from its normal position, and the two halves separated; from a paratype (glycerine mount).

Figure 15. Dorsal view of the superior half of the supra-anal process of *A. torontonensis*.

Figure 16. Dorsal view of inferior half of the same.
Figure 17. Subgenital plate of ♀ *Acroneuria cuestae*, from the allotype (pinned).
Figure 18. Sub-genital plate of ♀ *A. perbranchiata* Neave, from a paratype taken 25.vii.28, Whiteway Point, L. Winnipeg (alcoholic).
Figure 19. Sub-genital plate of ♀ *A. salvelini*, from the holotype (pinned).
Figure 20. Sub-genital plate of ♀ *A. fumosa*, from the holotype (pinned).
Figure 22. Sub-genital plate of ♀ *A. okanagan*, from the allotype (pinned).
Figure 23. Posterodorsal view of right genital hook of ♂ *A. perbranchiata* Neave, from a paratype taken 25.vii.28, Whiteway Point, L. Winnipeg (alcoholic).
Figure 24. Right genital hook of *A. cuestae*, from the holotype (pinned).
Figure 26. Right genital hook of *A. okanagan*, from the holotype (pinned).

FORSEBIA—A NEW GENUS OF AMERICAN EREBINAE (LEPIDOPTERA, NOCTUIDAE)

BY A. GLENN RICHARDS JR.

Univ. of Rochester, Rochester, N. Y.

Forsebia gen. nov.

Proboscis fully developed. First segment of palpus with a fringe of scales; second segment long, upturned and smoothly scaled. *Front rough, with a flattened or somewhat truncated prominence.* Genae quadrate ventrally. Male antennae ciliated, scaled above. Fore tibiae with or without claws; mid and hind tibiae with some fringing scales; mid tibiae of male swollen and enclosing a tuft of long sex scales. Metathorax with slight, depressed tuft. Abdomen smoothly scaled. Venation: fore wing with veins 3, 4 and 5 close together at lower angle of cell, 6 from upper angle, 7 connate from end of areole with 8+9 which are long-stalked (three-fifths distance from areole to margin), 10 from areole, 11 from cell; hind wing with veins 3 and 4 usually connate, 5 arising near 4 and rapidly diverging, 6 and 7 connate from upper angle, 8 touching cell at point only.

Male Genitalia: (figs. 1 and 3) almost symmetrical. Uncus long, pointed, somewhat cygnated, with short brownish, bifurcated setae on sides. Scaphium simple and well developed. Vinculum blunt or excavated at tip, its sides subparallel. Juxta scobinate above. Harpes lightly chitinized; clasper moderately long, strongly chitinized, practically alike on the two harpes; *sacculus weak, not extending beyond the clasper*; clavus present, with a well-developed basal lobe*; transtillae present. *Aedoeagus with two ventral ridges, one of them with a serrated edge.*

Female Genitalia: (figs. 2 and 4). Segment IX plus intersegmental membrane very long, in fully distended mounts 2½-3 times length of segment VIII. *Sternite VIII represented by two clear-cut narrow sclerites slightly but definitely separated at the ostium.* Slight sclerotization around point of entrance of ductus bursae into bursa. Bursa with many internal spines becoming weaker or absent basally. Ductus seminalis arising from bursa near ductus.

Tympanum: Typical of the tympanally very uniform *Melipotis-Drasteria* group. Only noticeable difference from my figure of *Syneda adumbrata*[1] being that pocket II is symmetrical in both subgenera of *Forsebia.*

Genotype: *Melipotis perlaeta* Hy. Edw.

*The homologies of the various apophyses of the harpes are in considerable confusion. I use the terms in the senses of various recent authors.

[1]Ent. Americana, N.S., vol. 13, pl. 8, fig. 63, 1933.

Forsebia subg. **Forsebia** subg. nov.

Third segment of palpus erect, only about as long as broad. Front with a low, rounded, truncated prominence crossed by transverse ridges; closely scaled. Fore tibiae with a large claw (macroseta) on inner apex and a smaller one on outer apex.

Male Genitalia: (fig. 1). Harpes spatulate, rather well chitinized. Vinculum long, blunt at tip. Juxta strong, deeply incised above and below. Basal lobe of clavus reduced on left harpe; clavus proper long. Transtillae narrow and moderately long. Aedoeagus with the two ventral ridges well-developed, one with a regularly serrate edge; vesica with many cornuti but without a large apical spine.

Female Genitalia: (fig. 2.) Apophyses of segment IX long, in fully distended mounts reaching base of VIII. Ostium broad and folded. Median parts of sternite VIII, area between them, ostium and distal end of ductus bursae minutely spinose. Ductus bursae without a ventral sclerotization near the ostium; the dorsal sclerotization very long and curving around the lateral sides of the ductus. Bursa with regularly arcuate, parallel ridges throughout (not shown in figure), these ridges themselves sinuate (very faint in some mounts), at the entrance of the ductus these ridges bear strong spines, the spines being about as long as the distance between the ridges (also some spines between the ridges); these spines become smaller and fewer in the middle region and are lacking entirely from the basal third.

Genotype and sole species: *Melipotis perlaeta* Hy. Edw.

perlaeta Hy. Edw.

Melipotis perlaeta Hy. Edw. (Papilio, 2: 14. 1882). Type locality: Prescott, Arizona. Type: Neumoegen Coll. (U.S.N.M.)

=*Synedoida aegrotata* Hy. Edw. (Papilio, 4: 47. 1884). Type locality: Arizona. Type: Neumoegen Coll. (U.S.N.M.)

=*Syneda flavofasciata* Stkr. (Lep. Rhop. Het., Suppl. 1, p. 12. 1898). Type locality: Arizona. Type: Strecker Coll. (Field Museum).

Distribution: Texas, Arizona, California.

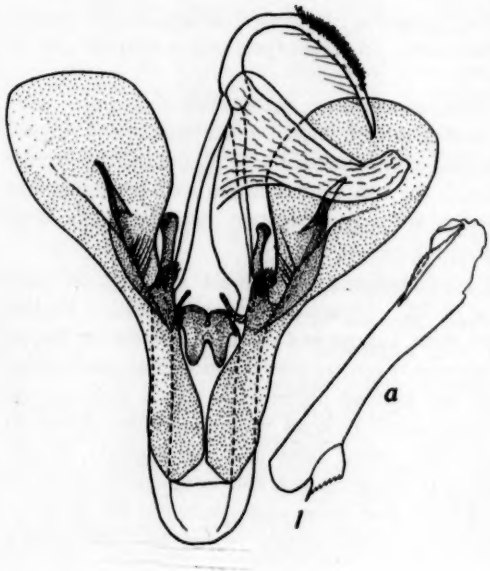
Figure: Female figured in Holland's "Moth Book" as a species of *Melipotis*.

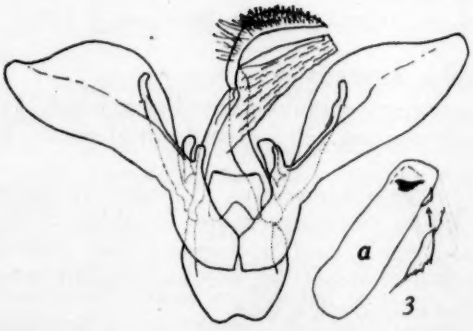
Forsebia subg. **Asyneda** subg. nov.

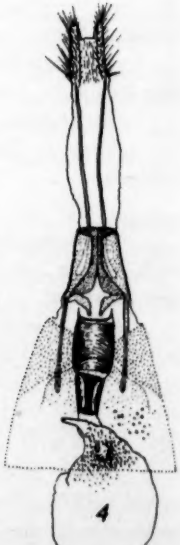
Third segment of palpus porrect, about three times as long as broad. Front rough, with a low flattened prominence, and with a pointed tuft of scales. Fore tibiae unarmed.

Male genitalia: (fig. 3). Harpes membranous. Vinculum of moderate length, excavated at tip. Juxta with an even margin above. Basal lobe of clavus same on the two sides; clavus proper short. Transtillae short and broad. Aedoeagus with the two ventral ridges less well developed, one with an irregularly serrate edge; vesica with many cornuti and a large apical spine.

Female genitalia: (fig. 4). Apophyses of segment IX reaching slightly beyond middle of segment VIII. Ostium rounded, not folded, no broader than the ductus bursae. Sternite VIII, region of ostium and distal end of ductus bursae devoid of minute spines. Ductus bursae with a strong, broad ventral







FORSEBIA

sclerotization near the ostium, slightly separated from a shorter dorsal sclerotization which curves partially around the lateral sides of the ductus. Bursa with less distinct ridges, the spines becoming smaller basally but present throughout.

Genotype and sole species: *Syneda mendozina* Hampson.

mendozina Hampson

Syneda mendozina Hampson (Lepid. Phal., N. Gen. & Spec. Noct., p. 44, 1926). Type locality: Mendoza, Argentina. Types: British Museum.

Distribution: Mendoza & La Rioja, Argentina.

Forsebia combines characters of *Melipotis* and *Cissusa* with those of *Drasteria*. The failure of the sacculus to form the margin of the harpe, the absence of the extension of the sacculus with a digitus-like prong beyond the clasper (rudimentary, to be sure, on the left harpe of some species of *Drasteria*), the absence of the ventral sclerotization of the ductus bursae in *perlaeta*, and the long, porrect third palpal segment in *mendozina* remind one of *Melipotis* and *Phoberia*. On the other hand, the palpi and tibial claws of the typical subgenus, and the uncus and roughened front of both subgenera are similar to *Drasteria*. The flattened or truncated prominence of the front, the elongated vinculum with subparallel sides, the serrated keel on the *ventral* side of the aedoeagus and certain other characters found in only one or the other of the above species differ from the condition found in any of these other genera.

The subgenera are described in comparison with one another and need no further comparison or discussion. Comparing their obvious close relationship with their distinctness from the other genera of this series, it becomes a matter of concept or personal preference as to whether to place them as genera or subgenera.

The genus is named, by necessity in anagram fashion, for Dr. Wm. T. M. Forbes of Cornell University, to whom I owe so much.

EXPLANATION OF FIGURES

Drawings made by the author with the aid of a camera lucida.

Fig. 1. Male genitalia of *Forsebia* (*Forsebia*) *perlaeta* (Hy Edw.). Fig. 1a. Aedoeagus of same, the ventral side towards the left; cornuti omitted from vesica. Specimen from Bill Williams Fork, Arizona.

Fig. 2. Female genitalia of *Forsebia* (*Forsebia*) *perlaeta* (Hy. Edw.). Arcuate ridges omitted from bursa. Specimen from Bill Williams Fork, Arizona.

Fig. 3. Male genitalia of *Forsebia* (*Asyneda*) *mendozina* (Hmpsn.). Fig. 3a. Aedoeagus of same, the ventral keel drawn alongside at a greater magnification; cornuti omitted from vesica. Specimen from La Rioja, Argentina (identified from types and loaned by British Museum.)

Fig. 4. Female genitalia of *Forsebia* (*Asyneda*) *mendozina* (Hmpsn.). Specimen from La Rioja, Argentina (identified from types and loaned by British Museum).

A REVIEW OF THE NEARCTIC GEOSARGINAE (DIPTERA, STRATIOMYIDAE)

BY MAURICE T. JAMES,
Colorado State College.

The subfamily *Geosarginae* forms a troublesome complex in the New World tropics, and much work will be necessary before certain generic and specific relationships can be determined. In the Nearctic region, however, conditions are not so serious; for, in spite of the fact that certain of the genera are not very satisfactorily defined, the species are comparatively few and, for the most part, quite distinct. It is hoped that the present review will serve to identify the

species found in America north of Mexico.

Unfortunately, considerable confusion has arisen in regard to the name of the type genus. Aldrich (1933) has briefly reviewed the history of the controversy regarding the names *Pedicella, Macrosargus, Sargus,* and *Geosargus.* In this paper, Aldrich shows that Brauer's designation of *Macrosargus tenuiventris* as the type of *Macrosargus* is invalid, and he, in turn, designates *Sargus tenebrifer* Walker, Bigot's first species, as the type; he then reduces *Pedicella* and *Macrosargus* to synonymy under *Ptecticus,* thus supposedly ending the controversy and eliminating the troublesome names.

In my opinion, however, *Sargus tenebrifer* Walker and *S. testaceus* F. (the type of *Ptecticus*) are not cogeneric, or should at least be separated subgenerically. In *S. tenebrifer,* vein R_{2+3} is contiguous with cross-vein r-m and arises as an apparent continuation of the cross-vein; it ends in the costa, along with R_1, approximately opposite the apex of the discal cell, and, together with R_1 and Rs, forms a broad triangle. In *S. testaceus,* R_{2+3} arises definitely before the cross-vein and runs almost parallel to R_1; it ends in the costa at some distance beyond the termination of R_1 and definitely beyond the apex of the discal cell. *S. tenebrifer* also differs from *S. testaceus* in that the abdomen, in the former species, is much more spatulate and the scutellum is semi-circular, rather than triangular, in dorsal profile. It is also quite different in appearance, superficially resembling *Hermetia illucens* Linn. In both species, the second antennal segment is strongly prolonged, on the inner side, into the third.

The synonymy, therefore, stands as follows:

Pedicella *Bigot,* 1856. Type, *Sargus tenebrifer* Walker.
Macrosargus Bigot, 1879.

Geosargus *Bezzi,* 1907. Type, *Musca cupraria* Linn.
Sargus Fabr, 1798, *nec* Walb., 1792.
Macrosargus auct., *nec* Bigot.
Pedicella Curran, 1927, 1934, nec Bigot.

Ptecticus *Loew,* 1855. Type, *Sargus testaceus* Fabr.

KEY TO THE GENERA.

The following key can be used as supplementary to that of Curran's *Manual.* The strap-like prolongation of the lower squama mentioned by Curran, though apparently quite a good character, is at times a difficult one to use. The key presented here is designed to be primarily utilitarian in character.

1. Scutellum definitely, though sometimes weakly, spined.....Nothomyia
   Scutellum wholly devoid of spines 2
2. Second joint of antenna strongly produced finger-like into the second, on the inner side 3
   Second joint of antenna not so formed 4
3. Vein R_{2+3} extending from the radial terminus of r-m to the termination of R_1 (not American) .....Pedicella
   Vein R_{2+3} arising before cross-vein r-m and running approximately parallel to R_1 .....Ptecticus
4. Anterior ocellus remote from the other two by a distance much greater than

the length of the base of the ocellar triangle*.....Geosargus
Ocellar triangle equilateral* 5

5. Abdomen short and broad, being much wider than the thorax and (exclusive of segment five) no longer than broad; eyes contiguous in the male and separated into definite zones of different-sized facets..... 6
Abdomen barely, if any, wider than the thorax; two or three times as long as wide; eyes separated in both sexes, and not divided into zones of different sized facets 7

6. Discal cell small; posterior veins weak, evanescent toward the wing margin ..... Microchrysa
Discal cell normal; posterior veins evident to the wing margin.....Isosargus

7. Lower squama with a strap-like projection (Neotropical and Old World) ..... Chrysochroma
Lower squama without such a projection (mostly Neotropical)...Merosargus

NOTHOMYIA Loew

1. Scutellum yellow; spines weak, being much shorter than half the distance between them (Cuba) .....*scutellata* Loew
Scutellum metallic green; spines longer than half the distance between them 2

2. Pleura of thorax and venter of abdomen metallic green; the apical third of all femora and the apical half of the middle tibiae bright yellow (Cuba) ..... *calopus* Loew
Pleura of thorax and venter of abdomen black; femora black, at most dull yellow at the narrow apex; tibiae black (Ohio) .....*viridis* Hine

PTECTICUS Loew

Two species occur in the northern states; others undoubtedly occur in the south-west. Of the two northern species, *P. sackeni* Will. has the front shining black, the hind basitarsi black, and the remainder of the hind tarsi white, whereas *P. trivittatus* Say has all these parts yellow or pale brown. *P. sackeni* may be *P. cyanifrons* Rond. The distribution of the species is as follows.

PTECTICUS SACKENI Will.

Not common, but widely distributed in the East. WIS.: Madison, July 20 (Fluke). N. J.: (Smith Cat.). CONN.: Stamford, July 10. TENN.: Smoky Mts., Sept. 1 (Fluke). MICH.: Ann Arbor, Aug. 13 (N. K. Bigelow). Type from FLORIDA.

PTECTICUS TRIVITTATUS Say.

MASS.: Buzzard's Bay (Dethiers); Dudley, July 10 (Bromley). CONN.: Stamford, June 30 to Aug. 25 (Bromley). N. Y.: Babylon, Aug. (Blanton). PA.: Pittsburg, Aug. (Scullen). N. J.: (Smith Cat.). N. C.: Nantahala Gorge (Banks); Blowing Rock to Linville, Sept. 8 (Banks). VA., GA.: (recorded by Williston as *similis*). IND.: (type). OHIO: Amherst, July (Reinhart). WIS.: Madison (Fluke). TENN.: Knoxville, spring, and Smoky Mts., Sept. (Fluke). IOWA: Wapello Cy. and Madison Cy., July, and Mt. Pleasant, Aug. (Jaques).

*G. *perpulcher* n. sp. has a much shorter ocellar triangle than in other members of this genus known to me; in this respect, it approaches *Merosargus*; but in other characters and in general aspect it is a *Geosargus*.

KANS.: Manhattan, June, at light (H. L. Nunamaker); Lawrence (Miriam A. Palmer). MO.: Columbia, Aug.

This species has been bred from Narcissus bulbs by Mr. F. S. Blanton.

GEOSARGUS Bezzi.

The Nearctic species, including the Cuban species known to me, may be separated as follows:

1. Pleura entirely yellow 2
   Pleura in large part black or metallic green 4
2. Dorsum of thorax largely yellow; predominantly yellow species, with the abdomen broadened and flat in both sexes.....*elegans* Lw.
   Dorsum of thorax wholly metallic green or purple..... 3
3. Face yellow; eyes contiguous in male (Cuba).....*lateralis* Mq.
   Face black; both sexes dichoptic .....*caerulifrons* Johns
4. Femora metallic green .....*viridis* Say
   Femora yellow or black, not metallic 5
5. Femora black; wings with a dark cloud over the discal cell..... 6
   Femora yellow; wings entirely hyaline 7
6. Posterior tarsi wholly black or brown (European, doubtfully American).....*nubeculosus* Ztt.
   Posterior basitarsi yellow .....*cuprarius* L.
7. Males 8
   Females 11
8. Eyes contiguous or nearly so; abdomen clavate 9
   Eyes separated by the width of the ocellar triangle; abdomen not clavate 10
9. Abdomen black .....*clavis* Will.
   Abdomen cupreus .....*lucens* Lw.
10. Pile of front largely black; anterior ocellus much less than twice the length of the base of the triangle from the posterior ocelli.....*perpulcher* n. sp.
    Pile of front wholly yellow; anterior ocellus twice the length of the base of the triangle from the posterior ones.....*decorus* Say
11. Metapleura metallic green, black, or brown..... 12
    Metapleura white 13
12. Pile of front black; abdomen distinctly bicolored, coppery and metallic purple .....*perpulcher* n. sp.
    Pile of front yellow; when bicolored, the colors of the abdomen merge one into the other, and are usually green and yellow.....*decorus* Say
13. Northern species*.....*clavis* Will.
    Cuban and Floridan species*.....*lucens* Lw.

Geosargus elegans Loew.

A handsome yellow species, readily recognized by the paired black spots, with purple reflections, on abdominal segments two, three, four and five, and the metallic stripe extending from the suture across the dorsum and over the scutellum. R_{2+3} and R_{4+5} are unusually short. In wing venation, the short body, the broad abdomen, and the handsome coloration, this species resembles such Neo-

*These species are variable, and insufficient material has been available to determine characters for their separation, if, indeed, they should be separated at all.

tropical species as *G. thoracicus* Mq., and with them form a natural subdivision of the genus. I have records from QUEBEC: (Curran), ONTARIO (Curran), MASS., CONN., N. Y., N. J., KY. (Johnson), FLA. (Johnson), IOWA (Bremer Cy., H. E. Jaques), and TEXAS (Donna Monk, and College Station, Reinhart). Type, Museum of Comparative Zoology.

Geosargus lateralis Mq.

In this species and in *G. lucens* Loew, the male is holoptic and has a strongly pedicellate abdomen; the latter is probably not distinct from *G. clavis* Will. *G. lateralis* is apparently common in Cuba. Type, Museum of Comparative Zoology.

Geosargus caerulifrons Johns.

KANS.: Baldwin, June 15, 1906 (J. C. Bridwell). N. J.: (Johnson). Type in the Museum of Comparative Zoology.

Geosargus viridis Say.

The most strongly metallic of our species; the thorax and abdomen are wholly metallic and usually concolorous, though the thorax may be green and the abdomen purple; the femora, front, and face are also metallic green. The short abdomen suggests affinities with *G. elegans*, though the general aspect is quite different. The distribution is as follows.

Common throughout the United States and Canada; I have records "from all the Canadian provinces" (Curran); from ME., N.H., MASS., CONN., N.Y., N.J., OHIO, ILL., MINN., WIS., MICH., S.D., IOWA, KANS., COLO., N.M., MONT., IDA., UTAH, ARIZ., WASH., ORE. and CALIF. Type lost.

Geosargus cuprarius Linn.

This European species, the genotype, has been very successfully introduced into North America and is now distributed from coast to coast. Recorded from "all Canadian provinces" (Curran), ME., N.H., MASS., R.I., CONN., N.Y., N.J., PA., OHIO, IND., WIS., MICH., MINN., S.D., IOWA, KANS., COLO., IDAHO., UTAH, WASH., ORE., CALIF. American records of *G. nubeculosus* Ztt., a very closely related species, are probably *cuprarius*.

Geosargus clavis Will.

Distribution: Atlantic States, MASS. to TENN. to FLA.

Geosargus lucens Loew.

Common in CUBA; extends into FLA.

Geosargus perpulcher n. sp.

A very handsome species from the Pacific north-west. Its nearest relative seems to be the European *G. splendens* Meig., which it closely resembles in appearance; the coloration of the legs is, however, different. It differs from other *Geosargus* species known to me in the short ocellar triangle and the fact that vein R_{2+3} is unusually long and bowed.

Female. Head black in ground color; an ivory band, interrupted medially, somewhat above the base of the antennae; the region between this band and the antennae more or less maculated with yellow; an elevated ridge, running from the ocellar triangle to the ivory band, metallic green. Ocellar triangle somewhat longer than wide, but not as elongate as in most members of this genus; the triangle is remote from the occiput, the posterior ocellus being definitely

before the posterior angles of the eyes. Occiput black; that part of it behind the vertex fringed with prominent pile, as on the vertex; this pile does not, however, extend laterally behind the eyes. Face, front, vertex, and adjacent part of occiput with conspicuous pile which is black on the front but merges gradually into yellow on the lower part of the face and on the occiput. Cheeks yellow-pilose. Proboscis yellow. Dorsum of thorax metallic green; pleura black, with more or less metallic green reflections; the sutures sometimes more or less yellowish; the pteropleura yellowish on the posterior half; humeri and the lateral margins of the pleura to the wing bases white. Scutellum green with definite yellow lateral and posterior margins; metascutellum metallic green. Abdomen variable, coppery and metallic purple; in the holotype, the first segment is coppery, with a purplish semi-circular spot on the basal three-fifths, and with narrow basal radiations of this spot, which extend to the lateral margins and there expand somewhat; segment two coppery, with a median cuneiform purplish marking, about one-seventh the width of the segment, which extends from almost the base to almost the apex; third and fourth segments purplish with very narrow coppery lateral margins; segments five and six wholly purple; venter coppery on first and second segments, black on the following segments, the third and fourth margined laterally and apically with yellow. The coppery color is usually much more extensive, both dorsally and ventrally; the purple may be reduced to a spot on the basal half of segment five. Pile of thorax and abdomen yellow. Legs yellow; the apical two or three segments of the fore and middle tarsi usually darkened; hind tarsi and usually the apices of the tibiae black or blackish. Wings smoky hyaline; vein R_{2+3} arises approximately opposite the apex of the discal cell, is much longer than the discal cell, and bows strongly toward R_{4+5}. Stigma wanting. Length, 10-13 mm.

Male. Vertex and front narrower, being no wider, at its narrowest point, than the ocellar triangle. Head metallic green. Abdomen much narrower, as in typical *Geosargus* species; black dorsally and ventrally, with strong coppery reflections. Otherwise as in the female.

Holotype: Female, Puyallup, Wash., Sept. 23, 1931 (J. Wilcox).

Allotype: Male, Puyallup, Wash., Sept. 3, 1931 (Wilcox).

Paratypes: 1 male, 12 females, Puyallup, Wash., Sept. 3-25, 1931 (Wilcox) and Sept. 2 and 9, 1932 (W. W. Baker); 1 female, Portland, Ore., Aug., 1932; 1 male, Macley Park, Portland, Aug. 27, 1932.

Holotype and allotype in the collection of the Colorado State College.

Geosargus decorus Say.

A widespread and extremely variable species. *Sargus punctifer* Bigot, *S. picticornis* Bigot, and *S. xanthopus* Wied. seem to be based on mere color variations which have not even varietal rank; I am therefore considering them absolute synonyms. "Common throughout Canada" (Curran). I have records from ME., VT., MASS., R.I., CONN., N.Y., N.J., PENN., FLA., OHIO, MINN., WIS., MICH., IOWA, S.D., KANSAS, TEXAS, COLO., WASH., ORE., and CALIF. Type lost.

MICROCHRYSA Loew.

We have two species, both introduced from Europe. *M. flavicornis* Mg. has a yellow antenna; the anterior and middle femora are wholly yellow; the

posterior ones are largely black. In *M. polita* Linn. (the genotype), the antennae are black, and there is considerable black on all femora. I have but a single record of *flavicornis*, a male, Boulder, Colo., July 14, 1932, on boxelder (James); this specimen is indistinguishable from English specimens in my collections. For *M. polita* I have the following records:

ONTARIO (Curran); QUEBEC (Curran); ME., VT., MASS., CONN., N.Y., N.J., PENN., MINN., WIS., S.D., IOWA, COLO., ORE., WASH. Mr. F. S. Blanton has taken it at Babylon, L.I., N.Y. "from Narcissus dump." I have taken it on boxelder. It is apparently common throughout its range, but often overlooked, because of its small size.

Isosargus n. gen.

The two Nearctic species that have been referred to *Chrysochroma* are not cogeneric with the European or Neotropical species, but are, on the other hand, more closely related to *Microchrysa*. I am, therefore, proposing the name *Isosargus* for the reception of these species and two others. Type, *Chrysonotus nigricornis* Lw.

The three genera above mentioned may be characterized as follows:

Isosargus. Eyes holoptic and divided into definite zones of different sized facets in the males, dichoptic and not so divided in the females; ocelli, in the males, almost contiguous with the occiput. Abdomen much broader than the thorax, barely longer than broad; segments two, three, and four, three to four times as broad as long. Discal cell of normal size; anal cell somewhat broader than the basal ones, about two-thirds the breadth of the combined basal cells; posterior veins strong and distinct to the wing margin.

Microchrysa. Differs from *Isosargus* chiefly in venation; the discal cell is unusually small, being much narrower than cell R_1; anal cell as broad as the combined basal cells; posterior veins weak, evanescent before they reach the wing margin.

Chrysochroma. Eyes dichoptic in both sexes, and not divided into zones of different sized facets; ocelli remote from the occiput by at least the length of the triangle; abdomen slightly broader than the thorax, elongate, about twice as long as wide; venation resembles that of *Isosargus*, but the anal cell is narrower, being approximately the width of the basal cells taken separately.

The four species of *Isosargus* known to me may be separated by the following table:

KEY TO SPECIES

1. Abdomen largely yellow, marked with black spots with metallic reflections 2
t Abdominal tergites wholly metallic green 3
2. Mesonotum wholly metallic green.....*canadensis* Curran
Mesonotum extensively yellow .....*similis* n. sp.
3. Abdomen, in addition to the softer pale vestiture clothed with dense, erect, stubby black pile, longer in the male than in the female....*nigricornis* Lw.
Abdomen clothed with soft yellow pile.....*texanus* Mel.

Isosargus canadensis Curran

Chrysochroma canadensis Curran, Trans. Roy. Soc. Canada, V, 197-198, 1927.
Type from Ontario; Canadian National Collection.

Isosargus similis n. sp.

In general appearance, this species resembles *Geosargus elegans* Lw.

Female. Entire body and appendages yellow, with the exceptions noted. Vertex and front metallic green, the front becoming yellowish below; ocellar triangle and occipital orbits black, not metallic, the latter evident above, evanescent below. Lower part of front and face, near base of antennae, whitish, not ivory white. First and second antennal segments whitish. Dorsum of thorax with a somewhat greenish metallic cast in certain lights, though distinctly yellow in ground color; its median third, from the suture to the scutellum, and the disc of scutellum metallic green in ground color; metascutellum somewhat darkened, opaque. Pleura with narrow white borders. Abdomen somewhat discolored dorsally; segments two, three, and four with rather indefinitely outlined black spots; these are paired, and show metallic green or bronze reflections under certain lights. Legs beyond the coxae more or less whitish. Wing veins yellow. Pile wholly yellow. Length, 6.5 mm.

Male. Ocellar triangle black; frontal triangle yellow. Abdomen yellow on segments one and two, the latter margined with black; black on four and five; more or less indistinctly black-spotted on segment three; the black regions with somewhat of a bluish or purplish reflection. Venter discolored. Otherwise as in the female.

Holotype: Female, Opelousas, La., May, 1897.
Allotype: Male, Opelousas, La., June, 1897.

The male allotype is somewhat eaten by *Anthreni*, but all the essential parts are well preserved. Types in the collection of the Colorado State College.

Isosargus nigricornis Loew.

Chrysonotus nigricornis Loew, Cent., vii, 14.

As Curran remarks, the antennae are usually yellow in this species, though they are described as largely black. Distribution: QUEBEC (Curran); ONTARIO (Curran); MASS. (Johnson); D.C. (Osten Sacken); N.Y. TENN.: Knoxville, spring of 1934 (Fluke). WIS.: Columbus, June (Fluke), and Madison, June (Fluke) and May 29 (M. H. Doner). MINN.: Ramsey County, June (H. H. Knight). IOWA: Jones, Emmet, and Buchanan Counties, June. KANS.: Baldwin, June 17, 1906 (J. C. Bridwell). OHIO: Columbus (Bridwell).

Isosargus texanus Melander

Sargus texanus Melander, Canad. Ent., 36:19, 1904.
All my additional records are from TEXAS.

MEROSARGUS Loew.

Primarily a Neotropical genus; I have an unidentified specimen from Arizona. A character which I have not seen mentioned in the literature, which may serve to distinguish the genus, may be found in the position of the origin of R_{2+3} in the species of *Merosargus* known to me, this vein arises less than the length of cross-vein r-m from, and often in conjunction with, the cross-vein, whereas in *Geosargus* and related genera, this distance is considerably greater.

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For other references, see Aldrich's Catalogue of the Diptera.

SOME PACIFIC COAST PANURGINUS (HYMEN., APOIDEA)

BY CHARLES D. MICHENER,

Pasadena, California.

Numerous species of bees, commonly referred to *Panurginus,* must, as has been shown by Crawford, be referred to *Pseudopanurgus.* This is brought out, not only by venation, but also by characters of the genitalia and sternites. It is possible that these insects are to be separated subgenerically from the coarsely punctate, typical, *Pseudopanurgus,* but their relationship is not with *Panurginus.* The South American species which I have seen are also *Pseudopanurgus.*

The following keys separate those North American species of *Panurginus* s. str. in which the males lack yellow markings.

Males:

Stigma pale brown; wings pale milky brown; flagellum brown beneath ..... *maritimus* Mich.

Stigma dark brown or black; wings clear or slightly grayish, not milky; flagellum black or nearly so 1

1. Anterior margin of clypeus with its emargination very broad and shallow; notauli and median line of scutum strong and raised, giving the scutum a three ridged appearance..... *gracilis* Mich.

Anterior edge of clypeus deeply emarginate; notauli and median line of scutum narrow impressed lines 2

2. Pubescence of head and thorax largely black..... 3

Pubescence of head and thorax largely pale..... 4

3. Length over 6 mm.; postscutellum duller, more like enclosure of propodeum ..... *nigrihirtus* Mich.

Length 5 mm.; postscutellum less dull, more like scutellum..... ..... *emarginatus* Mich.

4. Process of sixth sternite with a deep notch, leaving truncated pieces about as wide as the notch on each side..... *nigrellus* Cwfd.

Process of sixth sternite a broad emargination, not leaving such wide lateral pieces, or lateral pieces rounded and emargination shallow..... 5

5. Legs, abdomen, and stigma dark brown, or tarsi quite pale; process of sixth sternite long (see Crawford's figure)..... *atriceps* (Cress.)

Legs, abdomen, and stigma black, or the latter brownish in some lights; process of sixth sternite shorter 6

6. Process of sixth sternite with a small shallow emargination, the lobes on each side rounded and nearly as wide as the emargination..... *armaticeps* Ckll.

Process of sixth sternite with a broad emargination, the lobes on each side of it narrow 7

7. Process of sixth sternite narrow at base, apparently subapical; scutum quite dull ..... *melanocephalus* Ckll.
Process of sixth sternite broader at base, not supapical; scutum fairly shiny 8
8. Mandibles very long; scutum with few punctures, duller..... *ceanothi* Mich.
Mandibles short; scutum with many punctures, shining..... *gabrielis* Mich.

Females:

(The females are very difficult to identify, and records of females, unless accompanied by males, are subject to doubt).

Legs and abdomen, especially ventrally, dark brown..... *atriceps* (Cress.)
Legs and abdomen black 1
1. Stigma and wing veins brown; wings pale milky brown.... *maritimus* Mich.
Stigma and wing veins black or nearly so; wings clear or slightly grayish, not milky 2
2. Face usually with much black or fuscous hair; dorsum of thorax sometimes with a little fuscous hair; length usually a little over 7 mm.....
..... *melanocephalus* Ckll.
Face, especially clypeus, with much black or dark hair, scutum often with dark hair; clypeus and sides of face usually more coarsely punctate than in other species; length usually less than 7 mm..... 3
Pubescence all light, or clypeus with a little dark hair (sometimes a little dark on front and on anterior edge of scutum); length usually under 7 mm. 4
3. Post scutellum nearly as shiny as scutellum; smaller.... *emarginatus* Mich.
Postscutellum duller than scutellum; larger..... *nigrihirtus* Mich.
4. Length nearly 7 mm. ..... *nigrellus* Cwfd.
Length a little over 6 mm. ..... *gracilis* Mich.
Length 5½ mm. or less; scutum more shiny than in *gracilis* or *nigrellus* ..... *armaticeps* Ckll.

Descriptions of *Panurginus maritimus, nigrihirtus, emarginatus,* and *ceanothi* have been sent elsewhere for publication.

Panurginus gracilis n. sp.

Male (type): Length 5½ mm.; black; form slender; first joint of flagellum a very little shorter than second, distinctly shorter than third; mandibles fairly short, each reaching about to opposite edge of labrum; eyes convergent below; head much broader than long; cheeks narrow for the group; head and thorax mostly lineolate and rather dull, the scutellum and posterior part of scutum slightly shiny, the postscutellum about as scutellum, shinier, in most lights, than enclosure of propodeum; most of surface with a very few small punctures in addition to lineolation; clypeus more closely punctured than in most other species of the group; notauli broad, shining, elevated; median longitudinal line of scutum raised posteriorly; abdomen shining, finely lineolate; wings faintly dusky; stigma and wing veins black; first recurrent meeting or slightly distad to first transverse cubital; tegulae shining black, sometimes faintly piceous posteriorly; process of sixth sternite rather broad and short, distinctly concave apically, after the manner of Crawford's figure of *beardsleyi* (Ckll.); clypeus so broadly and shallowly emar-

ginate as to seem truncate with a small tooth at each end of truncation; pubescence practically all pale, or with a little fuscous on vertex and clypeus.

Female: Similar to male except for the usual sexual characters; scutum and scutellum more shiny; notauli and median line of scutum normal; clypeus more coarsely punctate.

Altadena, California (type locality), March 5, 1933, and February 28, 1932, on *Ceanothus crassifolius* (Michener, Coll.); mountains near Claremont, California (Baker). This last individual has been recorded as *P. atriceps* (Cress.)

The male is easily distinguished from all other black-faced species by the form of the scutum and the clypeus.

Panurginus gabrielis n. sp.

Male: Length 6 mm.; slender, black; first joint of flagellum shorter than second or third; mandibles short, each not or hardly reaching to the opposite side of labrum; eyes converging below; head much broader than long; head and thorax largely dull, the scutellum, scutum except anterior edge, and clypeus shining, not lineolate, but distinctly punctate; enclosure of propodeum slightly shiny, even when viewed from directly above. (In most of the other species the enclosure is perfectly dull when viewed from above, but viewed from behind, is slightly shiny); abdomen finely lineolate, hardly punctured; process of sixth sternite about as in *gracilis* Mich.; stigma and wing veins nearly black, the first recurrent meeting the first transverse cubital; tegulae shining black; anterior margin of clypeus rather deeply emarginate; pubescence pale, a few dark hairs around antennae and anterior edge of scutum.

Arroyo Seco (San Gabriel Mountains), Los Angeles County, California, January 27, 1935, on *Salix* (Michener).

In the large shining areas of head and thorax this resembles *P. armaticeps* Ckll., but that species has long mandibles and a different sort of process on sixth sternite.

Panurginus maritimus Michener

Female: Similar to male but flagellum only faintly brownish medianly on under side; pubescence pale, some dark hairs on vertex and front.

Dublin Canyon, Alameda County, California, May 6, 1917 (F. Muir, W. M. Giffard).

Panurginus armaticeps Cockerell

This is the most common *Panurginus* in southern California. The males vary from the large headed form with a gigantic tooth on each cheek, through large headed forms with untoothed cheeks, to forms with normal sized heads. Mandibles very long, even in small headed type; eyes less convergent than in most other species; first joint of flagellum a little longer than second, a little shorter than third; pubescence all pale; tegulae and legs black or nearly so in specimens which I have seen; process of sixth sternite about parallel sided, not widened apically, the apex bilobed, each lobe about as wide as the shallow emargination between them. The original description is evidently of a male, not female as stated. The form with toothed cheeks is less common than that with normal cheeks. I have only one specimen with toothed cheeks.

Female: Length 5 to 5½ mm.; similar to male except for the usual sexual

differences; head normal.

Mouth of San Antonio Canyon, April 2, 1933, on Willow (*Salix*); Eagle Rock, April 14, 1933, and April 17 and May 5, 1935, on *Rhamnus crocea*; Puddingstone Canyon (San Jose Hills), April 8, 1934, on *Cryptanthe*; La Crescenta, April 20, 1935, on *Rhamnus crocea,* all in Los Angeles County, California (Michener).

The *Panurginus atriceps* (Cress.) used in making the key are from Seattle, Washington.

A PRELIMINARY LIST OF THE COLEOPTERA FOUND ON POLYPORUS BETULINUS.

BY G. CHAGNON,
Montreal, Que.

During the summers of 1933 and 1934, I devoted a part of my time, while in the field, near Montreal, Que., to investigating the insect fauna of *Polyporus betulinus,* a common fungus found on dead birch. I am interested in preparing a local list as complete as possible of the insects living on this fungus. So far, 18 species of Coleoptera have been obtained, the list of which follows:

1. Family STAPHYLINIDAE.
   Bolitobius intrusus Horn
   " *cincticollis* Say
   " *anticus* Horn
   Philonthus cyanipennis (F.) (Numerous specimens).
   Sub-family: *Aleocharinae*: 2 species not identified.
2. Family OSTOMIDAE
   Thymalus marginicollis Chev. (Numerous specimens).
3. Family MYCETOPHAGIDAE
   Mycetophagus punctatus Say
   " *flexuosus* Say (numerous specimens).
   " *bipustulatus* Melsh.
   " *pluripunctatus* Lec.
4. Family TENEBRIONIDAE
   Upis ceramboides (L.)
   Diaperis maculata Oliv. (numerous specimens).
   Platydema americanum Cast. & Brul.
   Phellopsis obcordata (Kirby).
5. Family MELANDRYIDAE
   Penthe obliquata (F).
   Eustrophinus bicolor (F).
   Holostrophus bifasciatus (Say)

ERRATA

Page 186 September issue. The subfamily name Acridinae should be inserted to include *Pseudopomala* to *Stethophyma,* inclusive.

Date of mailing, Saturday, Jan. 4, 1936.